

hereditary station seem to have existed, for it was not every person who was honoured by so large a cairn."

The contents of the long-shaped barrows differed from those of circular outline. The former contained neither metals nor burnt bodies; all the human skulls were long or "boat-shaped;" and the barrows seemed of higher antiquity than the others.

The neolithic and the bronze people had similar customs; each disposed of their dead by cremation, as well as by burying some of them entire and in a contracted position; each used polished stone celts, and jet and amber ornaments; each made coarse pottery, and ornamented it with the same rude designs; and during each period the skulls of some of the people were long and narrow, whilst those of others were round.

The evidence of infanticide, slaughter of slaves, and cannibalism during the prehistoric ages is thought to be too conclusive to admit of doubt.

We must content ourselves with a brief mention of the Palæolithic "finds" described by the author. He first found bones in 1870 in Windy Knoll quarry, near the northern part of the mountain limestone of Derbyshire. Aided by Mr. Tym he began systematic work there in 1874, and Prof. Boyd Dawkins joined them in 1876. A cavity in the rock—not a cavern—proved to be crammed with remains of grizzly bear, wolf, fox, water-vole, shrew, bat, bison, reindeer, roe deer, hare, and rabbit. Omitting vast numbers of mere fragments, there were more than 3,500 bones and teeth of bison, of which a large number were calves; 1,200 specimens of reindeer, also including calves, but in a lower ratio; and sixty canine teeth of grizzly bear—the only ursine species met with. The remains varied much in their state of preservation, but a very large number were perfect, and many were in their proper relative positions.

The history of the "find" was probably this:—"A swampy place was resorted to by the migrating herds of bison and reindeer. The overflow would escape into the 'water-swallow' hard by, a precipitous place into which animals might and did fall." There was no trace of mammoth, rhinoceros, hyæna, or man.

A fissure in a mountain limestone quarry at the Staffordshire village of Water-houses yielded, in 1864, remains of mammoth, hippopotamus, and rhinoceros, about twenty feet below the surface of a deposit of loam and angular fragments of limestone, and containing a number of quartz pebbles. In 1873 relics of bison, horse, and wolf, were met with in a prolongation of the same fissure, but at not quite so low a level. The bones were probably all of them those of animals which had fallen in.

Mr. Pennington has increased the value of his book by giving an account of the Rev. Mr. Mello's discoveries in the caverns of the Permian formation at Creswell Crags, on the confines of Derby and Nottingham shires. Mr. Mello began his researches in 1875, and in 1876 an exploring committee was formed, who have thoroughly examined the Pin Hole, Church Hole, and Robin Hood Caves. In the last the deposits were, 1st, or uppermost, soil containing Romano-British relics; 2nd, breccia; 3rd, light-coloured "cave-earth;" 4th, a mottled bed; and 5th, or lowest, red sand. Remains of extinct animals occurred in the lowest three, and included *Machairodus latidens*, cave lion, leopard, wild cat, cave hyæna, wolf, fox,

Arctic fox, glutton, grizzly bear, brown bear, pole-cat, water-vole, mammoth, woolly rhinoceros, horse, bison, reindeer, great Irish deer, wild boar, and hare. We observe, however, that Prof. Boyd Dawkins does not mention the Arctic fox, or the glutton, or the wild boar as amongst the "finds" (see *Quart. Journ. Geol. Soc.*, No. 131, pp. 590, 602). The remains of hyæna were very numerous, and the condition of the older osseous relics betokened that at least most of them had been introduced by him. The author is of opinion that the fauna was Arctic or north temperate.

The lower deposits contained large numbers of broken and chipped fragments of quartzite, which must have been derived from a distance. Flint flakes occurred in hundreds, and of all sizes and forms, in the upper layers, where quartzite fragments were but few. Scrapers and lance-points were the commonest of the flint tools. Bone implements were also met with, and included a needle and a pin or lance-head, &c. There was also a sketch of a horse on a piece of flat bone—the first, and, up to the present time, the only example of palæolithic fine art found in Britain. The explorers also met with a piece of amber and bits of charcoal, and found reason to believe that the hare was largely used as food. The amber does not appear to be mentioned by Prof. Dawkins.

Our limited space forbids us to follow the author through his interesting speculations on palæolithic anthropology; but we cannot help doubting whether the exploring committees of the caverns near Settle and Torquay will endorse his opinion that "no caverns in this country have furnished such a variety of evidence as to ancient man and the animals which furnished him with food and clothing" as those of Creswell Crags. Those of us who at the close of the Plymouth meeting of the British Association, visited the caverns at Brixham and Torquay, and noted that they almost overhang the sea, cannot but regard the author's proposition that "the palæolithic cave dweller of England was an inlander" as being much too sweeping.

Finally, whilst perusing the volume which we now close reluctantly, we have again and again caught ourselves wishing that anthropologists would supply us with good definitions of "savage" and "barbarian," and tell us whether the words are to be used as synonyms.

OUR BOOK SHELF

Mathematical Questions, with their Solutions, from the "Educational Times." Edited by W. J. C. Miller, B.A. Vol. xxvii. from January to June, 1877. (London: C. F. Hodgson and Son.)

JUST fifteen years ago we became aware, by the chance sight of a copy of the *Educational Times*, of the existence of a paper which gave up three or four pages monthly to the proposal and solution of mathematical questions. We at once sent to England, and a more careful examination of the copy we received showed us that it was a publication of very high merit, at least as regarded this one department. Hitherto we had in the main confined our mathematical reading to the usual rut passed over by mathematical masters who have only to do with the teaching of ordinary boys; now we were induced to join the, at that date, small band of contributors who rallied round the mathematical editor and derived much pleasure and profit from the study of the many

elegant solutions which were constantly being given. We have the number for October, 1862, before us, in which are Questions 1312 to 1320 proposed under six different names; we turn to the number for the current month, and the questions range from 5387 to 5419 from as many individual proposers, whose names are given. Here is evidence that a want has been met, and that there is considerable vitality in this direction; indeed, we may remark that this is the sole English periodical (since the demise of the *Lady's and Gentleman's Diary*) to which mathematicians can send high-class problems. University and college examinations swallow up a great deal of what is produced by residents at the universities, but these pages are open to all comers.

It soon occurred to us that here was a great mass of useful work being done and yet not producing the full benefit it might do if it were reproduced and published in a separate volume. The editor at once fell in with our views; indeed we found that the like idea had occurred to himself. There were, however, supposed pecuniary and other difficulties to encounter, but at last these were got over and the work, after one volume had been published, took its present form, which is now a conspicuous one on many a student's shelf. The fact that now their solutions would be treasured up in this more desirable shape seems soon to have led our foremost mathematicians to give in their adhesion, and as we run over the long list of contributors prefixed to the volume before us, there is hardly a name familiar to us which is not to be found there. France, Italy, and America also, are fairly represented. Ladies, too, there are, showing that

"the gay determinant
For (them) its rows exchanges,
While Hamilton's weird delta turned (∇)
O'er all the symbols ranges."

It says very much for the ability, in more directions than one, of the editor, that he has nursed the bantling which was handed over to his care more than sixteen years ago into the vigorous and lusty athlete of to-day. Nothing mathematical comes amiss to his net, but we may say that though the *Dii majores* roam about in their own special pastures, he has a marked predilection for the line taken up and well-worked out by Messrs. Woolhouse and Crofton, *i.e.*, of probability in its many applications.

It only remains to say that the "Reprint" is more than a reprint, for it contains about as much more original matter as appears in the monthly paper. Space is found for detached papers and notes, and for alternative solutions, often of equal, if not greater, interest, than the previously published matter.

There are occasional parenthetical notes—we think it should be more clearly indicated who is responsible for these, as they are often valuable ones.

The training the printers have gone through in getting out these solutions has placed them on a high level as printers of mathematics, and the volumes of this series reflect great credit upon them.

Cronicon Científico Popular. Por D. Emilio Huelin. Vol. I. (Madrid: 1877.)

We perused this volume with interest and pleasant surprise; we were pleased at finding it to be an excellent and well-written review of all new occurrences in the scientific world, and we were surprised to see such a work emanate from a country which hitherto has contributed but too small a share towards the progress and welfare of science. If we place Turkey at the head of the list of the most unscientific countries in Europe, Spain and Portugal certainly come second on that list; it is gratifying, therefore, to see some sign of improvement. We congratulate Senor Huelin on his valuable publication, which is one of the best of the kind that has yet come under our notice. The arrangement of the contents of the

volume is particularly good. The first few chapters are dedicated to generalities and the philosophy of sciences; some of them contain detailed lists of all scientific publications in the world. Then follow numerous chapters relating to the latest discoveries, inventions, theories, &c., on the domains of physics, chemistry, astronomy, meteorology, mineralogy, and geology; the chapters of the physical section alone numbering no less than eighteen, and those of the chemical section as many as twenty. Any occurrence at all worthy of record up to the end of last year is faithfully mentioned in the book. The second volume will contain the biological and mathematical sciences. We wish Senor Huelin and his publishers every success with their valuable addition to scientific literature.

Die Naturkräfte. Band 21. "Die Insekten" (1st part): "Der Organismus der Insekten." With 200 original Woodcuts. By Dr. Georg Mayr. (München: R. Oldenbourg, 1877.)

THE importance of an examination of the internal as well as the external anatomy of insects has unhappily not hitherto engaged the attention which it deserves at the hands of British entomologists. It is a fact which cannot be disputed that by far the greater portion of that energy which our country has exhibited in the investigation of this branch of natural science has been devoted to the mere founding of types, and in consequence but little light has been thrown upon the ever-increasing array of problems which puzzle the biologist.

In studying the affinities of insects it is quite as important, and in all probability more so, that the internal structure and the embryology of insects should be known, as the external characters and the metamorphoses; it is therefore with unmixed pleasure that we welcome the appearance of Dr. Mayr's admirable and ably-illustrated treatise.

It would be impossible here to give even an outline of the vast series of facts which the learned author has brought together, nothing relative to the organism of insects being regarded as too insignificant for careful and unwearied research; as an instance of the thoroughness of his labours we would especially call attention to his interesting observations on the action of the legs of insects when walking, a point which he seems thoroughly to have studied and which he has amply illustrated, although many students would probably have regarded it as a matter of little moment. In fine, the entire volume is most valuable, and should be esteemed as a necessary hand-book, not only by every entomologist, but by all who have the interests of natural science at heart.

A. G. B.

LETTERS TO THE EDITOR

[The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications. The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.]

Glacial Geology of Orkney and Shetland

A RECENT visit to Orkney has brought forcibly before me certain points of the highest interest in modern glacial geology, upon which, I believe, the state of the surface deposits in these islands is calculated to throw considerable light.

I may premise that although I am perfectly well acquainted with all the usual glacial phenomena of the North of Scotland, as described in Geikie's and other works, I am not a sufficient practical geologist to speak with positive certainty, though I think I know enough of the subject to establish a *prima facie* case for what I have seen with my own eyes, and which I put forward in the hope that more competent observers may direct their